



**Risk Profile Topic Strategy for Traction Supply Systems
2007-08 to 2009-10**

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Introduction

This document summarises HMRI's strategy, current position and proposed work streams in the field of electrical traction supply systems¹ for 2006/07. It includes work to benchmark the level of compliance with the Electricity at Work Regulations 1989 (EAWR) and the high-speed Energy subsystem and Operational Technical Specifications for Interoperability (TSI) for the relevant parts of the GB railway industry.

The scope of the strategy includes the design, construction, use of, maintenance, operation and control of traction supply systems. It excludes depot traction supply systems and signal rooms or hazards arising from other electrical systems. It also does not address risks to trespassers, or passengers being evacuated from trains along the permanent way. Detailed descriptions of the scope of the strategy and background information are set out in the supporting document. Contact the author for further details.

The strategy is informed by intelligence gathered from HMRI and industry accident and incident data, feedback from inspection activity, and discussions with industry stakeholders and within the Office of Rail Regulation.

A core principle in health and safety law is to strike a balanced approach to risk management that eliminates or reduces risk so far as reasonably practicable. Any improvements in health and safety risk control must be seen in the context of financial and business risk. As technology, legislation and social perception of risk evolve, traction supply systems operators, designers and maintainers will always be challenged to justify their actions and inactions.

This strategy is one of a number of topic areas that have been treated in a similar way. The full context is described in the hyperlink introductory document - [introductory document](#).

Nature and extent of the risk

The RSSB Safety Risk Model (SRM) estimates that approximately 6 fatal and weighted injuries per year are caused by traction supply systems on the

¹ HSE Electricity at Work Regulations 1989 HSR24.

national rail network. This does not include all the incidents involving track workers or trespassers.

Data from incidents reported to HMRI under the Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR) indicate that on average there is one fatality per year and several serious and minor incidents throughout the railway network. The fatalities tend to result from unsafe systems of work and planning issues, rather than from asset malfunctions.

Summary of current position²

HMRI knowledge of the level of compliance with the EAWR and the Energy and Operational TSIs for traction supply system issues is incomplete. In 2002 the Health and Safety Executive (HSE) produced a report for HMRI, which reviewed certain work activities undertaken on the DC third rail system in southeast England. The report findings suggested that a number of activities might not fully comply with EAWR. HMRI and the Health and Safety Laboratory (HSL) undertook further work. This was presented to Network Rail and a 15-point improvement plan was produced for Network Rail to action in 2004.

The report raises concern about the level of compliance for other areas, not covered in the initial review, such as other parts of the DC system, AC systems on the national network and a variety of systems on other railways and tram systems.

In to address some of these “knowledge gaps” HMRI has undertaken a series of planned activities. However, the present approach is generally reactive and selective. HMRI are working to develop a more systematic and consistent methodology for quantifying overall level of EAWR compliance and the risk profile of different sectors of GB railway industry.

Network Rail has been proactive in electrification asset management and has acknowledged that the age profile of some of its electrified assets, particularly distribution equipment is poor with much equipment approaching life expiry. Their 2003 Technical Plan identified a 10-year strategic approach to renewal of electrification assets for the first time³. The plan highlighted the need for significant increases in activity to address the operational and safety risk associated with the aging profile of the infrastructure.

² Contact the author for further details and background.

³ Network Railways 2004 Technical Plan.

Other railway networks, which include London Underground (LU) and Tram systems, have similar core activities and challenges with the former also having electrical assets that are becoming life expired. Operational differences may result in different solutions being implemented, but the opportunity to share best practice needs to be fully realised.

HMRI traction supply system inspections on non-NR systems have been generally restricted to reactive investigation, although some proactive work with LU has been undertaken on the topic of electrical isolations.

Under the Railways and Other Transport Systems (Approval of Works, Plant & Equipment) Regulations 1994 (ROTS) HMRI had a formal role to approve equipment and systems and worked together with dutyholders and stakeholders. Over time, improvements in equipment design have resulted in different standards and practices being accepted.

HSE has recently reviewed the EAWR and no revisions of the Regulations are being proposed in the medium term.

As part of NR's licence requirements they must demonstrate compliance with an array of conditions in particular asset management and asset knowledge. In 2005 NR conducted an assessment of asset information needs by asset type. The findings of this assessment showed that electrical and plant assets were poor in respect to recording asset types, date of installation and condition.

ORR together with NR developed and agreed revised guidelines to achieve compliance with condition 24 of the licence, namely the Asset register. This work is continuing and will be monitored and reviewed by ORR. ORR estimates that NR spends approximately 5% of its renewal budget on E&P assets.

ORR Corporate Strategy

ORR has a long-term vision for the main-line railway industry, which includes infrastructure controllers, operators, suppliers and funders working together to deliver a safe, high performing and efficient railway⁴.

ORR also recognises our health and safety regulator responsibilities across Great Britain's railway industry including London Underground, metros and heritage railways.

Over the 2006-2009 period ORR's focus will be on:

⁴ ORR Corporate Strategy:2006-09 and Business Plan 2006-07.

- securing continuous and sustained improvement in health and safety, performance and customer service;
- Periodic Review to set funding/output 2014 for control period four;
- pursuing relentless improvement in the industry's efficiency and value for money, and;
- through these and other actions, enabling the railway to grow and develop to meet the requirements of funders and aspirations of stakeholders.

In relation to health and safety performance for Great Britain's railways the ORR's general approach is to:

- monitor and enforce compliance with health and safety law;
- encourage and promote the achievement of continuous improvement in health and safety by the rail industry through good management, improved processes and renewal of equipment;
- encourage and facilitate more efficient ways of delivering this continuous improvement;
- facilitate an informed debate about options to address risks which are of concern to society, but where there is currently no legal requirement, and
- engage effectively with the full range of stakeholders on health and safety issues.

HMRI's Core Purpose

Within the new combined economic and health and safety regulator, HMRI's core purpose is to secure the proper control by dutyholders of risks to the safety and health of passengers, employees and others who might be affected by the operation of Britain's railways.

Strategic aims

- To benchmark the level of railway industry compliance with EAWR and TSIs;
- To identify current best practice for traction supply systems;

- To ensure dutyholders have effective management systems and procedures that achieve compliance with EAWR and relevant TSIs;
- To engage effectively with the industry in technical debates;
- To ensure that appropriate standards are in place for traction supply system design, construction, use, maintenance, operation and control based upon statutory requirements and best practice;
- To work with industry and stakeholders to ensure that risks from traction supply systems are reduced so far as is reasonably practicable;
- To promote proportionality, consistency, transparency in HMRI activities by production of clear guidance on standards and enforcement issues;
- To ensure relevant recommendations arising from investigations of major incidents and Rail Accident Investigation Branch (RAIB) investigations, as well as HMRI and industry investigations are satisfactorily addressed; and
- To support and monitor appropriate research projects;

Delivery of the strategy

The following work streams are identified as broad groups of activities that will be further scoped into work activities to be undertaken over the lifetime of this strategy. Some work activities will inform future delivery plans and others will influence policy, procedural and planning needs.

The primary work stream should be the benchmarking exercise where it is anticipated that the outcomes from such an exercise will determine, to what extent and timescale, the following work streams are to be undertaken.

Inspection

- Inspection of traction supply systems to ensure that adequate operational, and maintenance procedures are in place and in use; and
- Inspection of dutyholders' and stakeholders' safety management systems for ensuring traction supply systems assets remains safe in all modes of operation.

Reactive/investigation work

- Investigation of traction supply systems incidents and complaints, to determine root causes, and gather intelligence for securing continue improvement; and
- Enforcement action in accordance with ORR's Enforcement Policy Statement.

Monitoring

- Monitoring the quality of industry investigations and reports, including the appropriateness of recommendations, timescales and completion;
- Ensuring that Delivery Plan activities are undertaken in a timely manner to an agreed standard, with clear identified outputs. The outputs will be used to influence future delivery plans and HMRI investigation while adding value to dutyholders and stakeholders and the industry at large.

Liaison

- Engagement with dutyholders and stakeholders to clarify requirements and expectations in relation to traction supply systems safety and statutory consultation, and secure commitment to meet those expectations; and
- Making positive and informed decisions on attendance at NR, and non-NR, RSSB, RAIB and other railway and industry meetings, forums and conferences to ensure that ORR is fully aware of the current and future developments so the appropriate actions can be considered and taken.

Research

- Promotion of research that contributes to the aims of the strategy; monitoring and contributing to traction supply systems research programmes, and securing appropriate action to implement recommendations.

